

Asthma in Missouri Schools

Asthma is a serious health issue for many children in Missouri. Children with poorly controlled asthma are limited in their ability to participate in usual children's activities and frequently miss school, which impacts their education and learning performance. Children who have asthma experience episodes where they have difficulty breathing air into their lungs. Symptoms include shortness of breath, wheezing, chest tightness and coughing which is often the first symptom. The cause of asthma is unknown, but various "triggers" cause the airway to react with inflammation and narrowing, which leads to partial-to-complete obstruction. Some common triggers include tobacco smoke, mold, outdoor air pollution, common cold, flu and many other substances, irritants and allergens.

Triggers for an asthma attack vary from person to person but children are especially vulnerable to respiratory distress due to small airways. An asthma attack requires immediate relief using short-acting medication, thus the need to have access to this medication at all times is critical. However, the goals are to prevent such episodes. Schools and school nurses can play a vital role in helping children control their asthma. School policies and practices such as allowing students to carry asthma medication, up-to-date Asthma Action Plans, case management, safe and healthy schools environments and having a school nurse to identify, assess and monitor students with asthma can greatly improve asthma control in children.

ASTHMA IN CHILDREN

- Asthma is one of the most common chronic disorders to affect children in the U.S.¹
- In the U.S., during 2001-2009, childhood asthma prevalence increased significantly from 8.7 percent to 9.6 percent.² The prevalence also increased in Missouri between 2006 and 2010, but not significantly (Figure 1).³
- Among children (age 17 and younger) the current asthma prevalence in Missouri was 10.9 percent (95% confidence interval [CI] 8.3 - 13.5) in 2010 compared to the U.S. childhood prevalence of 9.6 percent (95% CI 8.9 – 10.4) in 2009.³ In Missouri, this is now more than 155,000 children living with current asthma.⁴
- Low income and minority children bear the heaviest burden of asthma.
- In 2008, children age 17 and younger comprised 24.1 percent of Missouri's population but accounted for 42.6

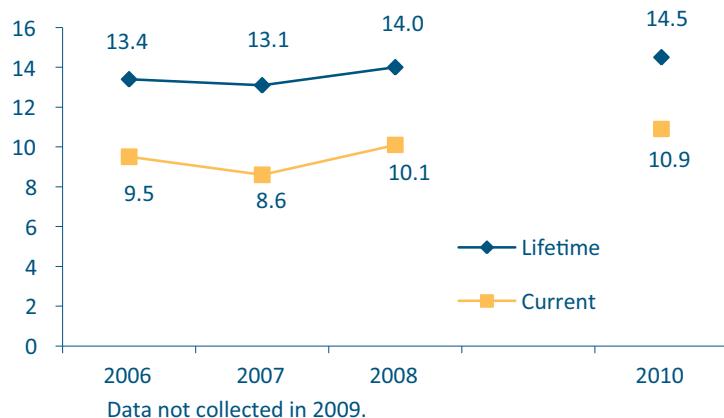


percent of the 29,695 asthma ED visits and 34.3 percent of the 8,239 asthma hospitalizations in Missouri.⁵

SCHOOL ABSENTEEISM

- Asthma is a leading cause of school absenteeism due to a chronic condition.
- Nationally, children who had at least one asthma episode during the previous year (4 million children) missed a total of 12.8 million school days.⁶
- Children with disabling asthma have long-term reduction in their ability to participate in usual activities such as attending school, and engaging in play or after school sports and average 20 restricted activity days annually, including 10 days lost from school.⁷
- Excessive absenteeism has been shown to have a negative impact on standardized test level achievement and children with persistent asthma experience recurring episodes of absenteeism, which may contribute to decreased school performance.⁸

Figure 1. Prevalence of lifetime and current asthma among children (age 0-17 years), Missouri



SCHOOL HEALTH PROFILE⁹

- The Division of Adolescent and School Health program at the Centers for Disease Control and Prevention has administered the School Health Profile (SHP) in even-numbered years in Missouri since 1994.
- The survey is designed to monitor health policies and practices in public schools.

Table 1. Asthma management activities in secondary schools, 2010

Percentage of schools:	Participating States*	Missouri Percent of schools (95% CI)
	Median (Range)	
Provided intensive case management for students with poorly controlled asthma while at school	25.7 (9.8 - 50.6)	26.2 (22.1 - 30.8)
Can identify students with poorly controlled asthma by keeping track of them in at least three different ways	63.9 (40.7 - 75.9)	67.0 (61.8 - 71.9)
Provided parents and families with health information to increase their knowledge of asthma	20.0 (6.6 - 37.3)	24.5 (20.7 - 28.8)
Implemented a policy permitting students to carry and self-administer asthma medications and by designating an individual responsible for implementation of the policy	52.5 (21.9 - 69.6)	51.1 (46.6 - 55.7)
Provided a full-time registered nurse who provides health services to students while at school	43.9 (4.9 - 99.4)	75.8 (72.3 - 78.9)
Have an Asthma Action Plan on file for all students with asthma	58.5 (31.0 - 87.6)	63.9 (59.3 - 68.2)
Required all school staff members to receive annual training on recognizing and responding to severe asthma symptoms	30.8 (11.6 - 65.8)	40.6 (35.9 - 45.6)

*Among the 47 (teacher survey) or 49 (principal survey) participating states

- The SHP is sent to principals and designated lead health education teachers in a sample of Missouri's public secondary schools.
- The data reported in the SHP are on schools.
- The 2010 Missouri secondary school findings are shown in Table 1.
- More than two-thirds of schools in Missouri identify and track students with poorly controlled asthma (67.0%) and more than one-half had policies allowing students to carry and self-administer medications (51.5%).
- More than one-third of Missouri schools educated school staff at annual trainings about severe asthma symptoms (40.6%).
- Access to school nurses is one of the most important factors in controlling asthma for students.
 - Table 1 shows that 75.8 percent of Missouri schools had a full-time registered nurse providing health services; this is higher than the national median of 43.9 percent.
 - The National Association of School Nurses recommendation is a 750-to-1 ratio, which for the 2010-2011 school year, Missouri is at 736 students for every school registered nurse.
- Asthma Action Plan
 - See Box 1 for more details on Asthma Action Plans.
 - Table 1 shows that 63.9 percent of Missouri secondary schools had an Asthma Action Plan for all students with asthma compared to the national median of 58.5 percent.

- More than one-fourth (26.2%) of Missouri schools provided intensive case management for students with poorly controlled asthma.

SCHOOL NURSE SURVEYS

Two recent school-based surveys have addressed asthma in Missouri schools. They were carried out with the cooperation of the Missouri Department of Elementary and Secondary Education. They targeted school nurses as an important source of information on health issues in the school setting.

- The surveys are the:
 - Missouri School Health Services Program (MSHSP) Special Health Care Needs Survey¹⁰
 - MSHSP Contractor Survey¹¹
- These surveys differ from the SHP because they collected data at the student level rather than the school level and respondents were school nurses rather than principals or health education teachers.

BOX 1. ASTHMA ACTION PLAN⁶

- Written, easy-to-understand description of how to manage an asthma exacerbation, or attack
- Individualized for each person with asthma
- Outlines basic information
 - Early signs of worsening asthma
 - Steps to take during an asthma episode
 - Medications to use and how to use them
 - When to contact a doctor or seek emergency services

1. MSHSP Special Health Care Needs Survey

School nurses in the more than 520 Missouri public school districts were surveyed to collect data on special health care needs among students in kindergarten through grade 12. The surveys are administered every other school year and the results are shown in Table 2.

Table 2. MSHSP special health care needs survey response rate and asthma medication results

School Year	Response Rate Number Surveys Returned/ Total Districts	Students on Asthma Medication	
		Number on Meds/ Total Students	
2006 - 2007	88.9 % (466 / 524)	7.6% (62,892 / 823,293)	
2008 - 2009	91.4% (478 / 523)	7.7% (66,617 / 863,943)	
2010 - 2011	97.0% (489 / 523)	9.1% (78,167 / 861,060)	

- From 2006-2007 to 2010-2011 school year the response rate improved by 4.9 percent. The percent of students on asthma medication at home and/or at school increased by 24.3 percent.

2. MSHSP Contractor Survey

Additional data were collected on school districts that contracted with the MSHSP. The surveys were administered annually and the results are shown in Table 3.

- As shown in Table 3, the percent of students with asthma and students receiving asthma medication increased from 2008-2009 to 2009-2010.

- Of the students with asthma, 1,080 were reported to be in the asthma care coordination program with 97 percent showing improvement in at least one area.

CONCLUSIONS

- Asthma is a significant chronic condition among children.
- Students with asthma miss on average 3.2 days of school each year but may be as many as 10 missed days depending on asthma severity.
- Excessive absenteeism affects standardized test achievement and may affect overall academic performance.
- Many parents miss work due to their children's school absenteeism.
- School nurses estimate asthma prevalence.
- According to the Missouri Behavioral Risk Factor Surveillance Survey (BRFSS), 10.9 percent of school-age children are currently living with asthma,³ compared to what school nurses reported (8.1%).
- National prevalence of disabling asthma among children is 1.4 percent,⁷ and this is also comparable to rates reported by school nurses (1.0% to 2.4%).^{12, 13}
- The SHP reported that Missouri equals or surpasses national recommendations for student access to school nurses.
- The Centers for Disease Control and Prevention have established strategies that schools can follow to become "Asthma-Friendly Schools."¹⁴
- Missouri schools are addressing many components that make up an "Asthma-Friendly School," but there may be some room for improvement.
- Asthma Action Plans are an important part of having an "Asthma-Friendly School."

Table 3. MSHSP contractor survey response rate and asthma results

School Year	Number of School Districts* Surveyed	Percent of Public School Districts	Number of Students Represented	Percent of Students with Asthma	Percent Receiving Asthma Medication at School/Home**	Percent with Asthma Action Plan ***
2005 - 2006	309 (251 public)	47.9%	270,806	—	3.2%	—
2006 - 2007	305 (249 public)	47.5%	272,762	—	3.1%	—
2007 - 2008	290 (327 public)	55.3%	274,515	—	3.2%	—
2008 - 2009	284 (232 public)	54.3%	271,860	7.9%	3.1%	44.2%
2009 - 2010	269 (228 public)	43.7%	266,078	8.1%	3.4%	40.7%

* Public and private school districts included in total. ** Denominator is number of students represented.

***Denominator is students with asthma. — Data not collected during this year.

RECOMMENDATIONS

- Nurses should identify children with asthma and regularly assess and monitor asthma status in these children, including use of objective measures of lung function and be actively involved in:
 - Controlling factors that trigger asthma episodes and contribute to asthma severity.
 - Educating patients with asthma and their parents to become partners in their own care.
 - Managing asthma with pharmacologic therapy in the school setting and instructing students on delivery devices and effective inhalation technique to assure medication reaches the affected airways
 - Collaborating with local health care providers on asthma care.
- Schools should continue to improve their capacity to create “Asthma-Friendly” or “Asthma-Ready Schools.”
- Interventions should target school nurses to utilize their relationship with students who have asthma.

ADDITIONAL RESOURCES

- Missouri School Asthma Manual
<http://health.mo.gov/living/healthcondiseases/chronic/asthma/pdf/asthmamanual.pdf>
- Asthma Management in the School Setting
<http://www.nasn.org/PolicyAdvocacy/PositionPapersandReports/NASNIssueBriefsFullView/tabid/445/smid/853/ArticleID/69/Default.aspx>
- Asthma Ready Schools
<http://www.asthmaready.org>
- Asthma – School and Childcare Providers
<http://www.cdc.gov/asthma/schools.html>
- Indoor Air Quality (IAQ) Tools for Schools
<http://www.epa.gov/iaq/schools>

GLOSSARY^{15, 16}

Asthma: A chronic, inflammatory disease of the airways of the lungs. This swelling causes the airways to narrow. There is also an increase in mucus further narrowing the airways of the lungs making it difficult to breathe.

Chronic Disease: A disease that lasts for years. A chronic disease like asthma has no cure, but can be controlled.

Confidence Intervals: A range of values, calculated from the sample observations that include the true value. For prevalence, the 95 percent CI will include the true rate 95 percent of the time, if the samples and calculations are repeated many times. The end points of the CI are called the Confidence Limits.

Control: Comprised of two parts - reduced impairment (prevent chronic symptoms, require infrequent use of short-acting relief medication, maintain normal lung function and activity levels, and meet expectations of and satisfaction with asthma care) and reduced risk (prevent recurrent attacks, minimize the need for emergency department visits or hospitalizations, prevent loss of lung function, or for children, prevent reduced lung growth and provide medication with optimal benefits and minimal or no adverse effects).

Delivery Devices: Equipment or dispensers that help get medication to the lungs.

Disabling Asthma: A long-term reduction in the ability to participate in children’s usual activities, such as attending school or engaging in play, due to asthma.

Inhalation Technique: Proper way and speed to breathe in medication to maximize delivery to the lungs and benefit.

Morbidity: Refers to illness, disability or poor health due to any cause.

Prevalence: Number of existing cases of a disease during a certain time period in a specified population.

Triggers: Things that can bring on symptoms of asthma. Triggers are different for different people. Common asthma triggers include: cigarette smoke, cats, mold, mildew, dust mites, roaches or ragweed. Other common triggers are colds and flu, exercise, strong emotions, cold air, beer, wine, change in weather and some medication.

Wheeze: Difficulty breathing causing a whistling sound; often associated with chest tightness.



REFERENCES

¹Markus, Lyon & Rosenbaum. (2010). Changing pO₂licy: The elements for improving childhood asthma outcomes. The George Washington University School of Public Health and Health Services, The Department of Health Policy. Retrieved June 15, 2011, from www.mcanonline.org/policy_issues.

²Zahran, HS, Bailey, C, & Garbe, P. (2011). Asthma prevalence, disease characteristics, and self management education – United States, 2001-2009. Morbidity and Mortality Weekly Report, 60(17), 547-552. Retrieved July 12, 2011, from http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6017a4.htm?s_cid=mm6017a4_w.

³Missouri Department of Health and Senior Services. (2011). Behavioral Risk Factor Surveillance System 2010 data. Jefferson City, MO: Office of Epidemiology. Retrieved August 3, 2011, from <http://www.health.mo.gov/data/brfss/data.php>.

⁴Howden, LM, & Meyer, JA. (2011). Age and sex composition, 2010. 2010 Census Brief. U.S. Census Bureau. Retrieved July 13, 2011, from <http://www.census.gov/prod/cen2010/briefs/c2010br-03.pdf>.

⁵Missouri Department of Health and Senior Services. Missouri Information for Community Assessment. Emergency Room and Hospital Discharges, Charges and Days of Care. Retrieved June 16, 2011, from <http://health.mo.gov/data/mica/MICA>.

⁶Akinbami, LJ. (2006). The state of childhood asthma, United States, 1980-2005. Advanced data from vital and health statistics; No. 381, Hyattsville, MD: National Center for Health Statistics.

⁷Newacheck, P., & Halfon, N. (2000). Prevalence, impact, and trends in childhood disability due to asthma. Archives of Pediatrics & Adolescent Medicine, 154, 287-293.

⁸Moonie, S, Sterling, DA, Figgs, LW, & Castro, M. (2008). The relationship between school absence, academic performance, and asthma status. Journal of School Health, 78(3), 140-148.

⁹The Centers for Disease Control and Prevention. (2010). School Health Profiles - Selected Topics. Retrieved October 5, 2011, from http://www.cdc.gov/healthyouth/profiles/pdf/facts/mo_selected_profiles.pdf.

¹⁰Missouri Department of Health and Senior Services, Section for Healthy Families and Youth. Missouri School Health Services Program, Special Health Care Needs Survey, unpublished data.

¹¹Missouri Department of Health and Senior Services, Section for Healthy Families and Youth. Missouri School Health Services Program Contractor Survey, unpublished data.

¹²Francisco, B. & Klein, T. Childhood Asthma: Understanding and Addressing the Public Health Problem. Missouri Youth Initiative: Step-by-Step Toward Missouri's Future. Retrieved July 25, 2011, from <http://www.oseda.missouri.edu/step/vol15/no5/step1005.html>.

¹³University of Missouri Children's Hospital. Missouri Disabling Asthma Survey, 2005, unpublished data.

¹⁴The Centers for Disease Control and Prevention. Initiating Change: Creating an asthma-friendly school. Retrieved July 25, 2011, from <http://www.cdc.gov/HealthyYouth/asthma/creatingafs/index.htm>.

¹⁵The Centers for Disease Control and Prevention. Glossary. Retrieved July 25, 2011, from http://www.cdc.gov/cancer/npcr/uscs/data/00_glossary_include.htm#C.

¹⁶Rodriguez, J, Valderrama, Y, Surkan, P, Rudd, R, & Daltroy, L. (2004). Asthma glossary: keywords in plain language. Boston, MA: Harvard School of Public Health. Retrieved July 25, 2011, from <http://www.hsph.harvard.edu/healthliteracy/files/asthmaglossary.pdf>.



Missouri Asthma Prevention and Control Program

Missouri Department of Health and Senior Services

P.O. Box 570

Jefferson City, Missouri 65102-0570

800-316-0935

E-mail: info@health.mo.gov

Website: <http://health.mo.gov/living/healthcondiseases/chronic/asthma/index.php>

AN EQUAL OPPORTUNITY/AFFIRMATIVE ACTION EMPLOYER
Services provided on a nondiscriminatory basis.

